11TH MEETING OF THE SPRFMO COMMISSION

Manta, Ecuador, 13 to 17 February 2023

COMM 11 – Obs 05

HSFG Submission to the SPRFMO Commission

High Seas Fisheries Group

TO: The SPRFMO Commission

10 January 2023

HIGH SEAS FISHERIES GROUP SUBMISSION SUMMARY, SPRFMO 2023

The High Seas Fisheries Group (HSFG) has previously highlighted a large and growing imbalance in the SPRFMO approach to managing the impact of bottom fisheries on VMEs, under which SPRFMO has implemented major spatial fishing closures to bottom fisheries without a clear scientific rationale, and while critical definitional questions remained unresolved, including an operational definition of Significant Adverse Impacts (SAI).

Now SPRFMO considers proposals to require additional spatial fishery closures. In our submission to the SPRFMO Commission we demonstrate that the proposed rationale for new closures:

i) … is not scientifically consistent with prior Scientific Committee advice or international precedent; and
ii) … is not legally consistent with international requirements under UNGA and the FAO, or with practices in other RFMOs; and
iii) … is in clear breach of the requirements of the Bottom Fisheries Impact Assessment Standard adopted by SPRFMO in 2019.

On this basis we argue that no new closures should be adopted until the identified deficiencies are rectified.

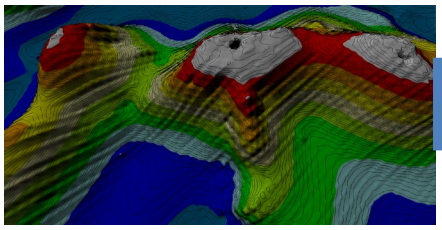
To achieve this, we outline a path to a more clearly defined bottom fishing impact management framework, with a quantitative impact-based performance metric to evaluate whether impacts are high enough to be considered 'significant adverse impact', as required by the international legal guidelines and the founding principles of the SPRFMO Convention.

We argue that until that framework is in place and the Bottom Fisheries Impact Assessment has been updated, no further changes to CMM-03 should be adopted relating to move on rules, encounter protocols, or additional spatial fishery closures.

HSFG is here to help members, as we have done for more than a decade since the inception of SPRFMO and the interim measures. We ask that members please take the time to become familiar with the background and basis for the arguments expressed in this paper, even if their own industries have no direct link to bottom fishing in SPRFMO. HSFG stands in opposition to those who would use vague or emotive arguments to undermine sustainable food production without reference to sound scientific and legal principles. We worry that if SPRFMO pushes ahead with changes to CMM-03 that are scientifically and legally indefensible, and contrary to standards which SPRMFO has already adopted, this action will set dangerous precedents for other fisheries both in and out of SPRFMO, and will risk undermining the SPRFMO Convention.

Sincerely yours,

Andy Smith, Chair HSG



High Seas Fisheries Group Incorporated

TO: The SPRFMO Commission

10 January 2023

HIGH SEAS FISHERIES GROUP COMMENT REGARDING PROPOSED CHANGES TO THE SPRFMO APPROACH TO MANAGING BOTTOM FISHING IMPACTS UNDER CMM-03

Executive Summary

SPRFMO has implemented major spatial fishing closures to bottom fisheries, and now considers proposals to require additional closures, without a clear scientific rationale while critical definitional questions remained unresolved, including an operational definition of Significant Adverse Impacts (SAI). We demonstrate below that:

1. The proposed rationale for new fishery closures
   i) … is not scientifically consistent with prior Scientific Committee advice or international precedent; and
   ii) … is not legally consistent with international requirements under UNGA and the FAO, or with practices in other RFMOs; and
   iii) … is in clear breach of the requirements of the Bottom Fisheries Impact Assessment Standard adopted by SPRFMO in 2019.

   On this basis no new closures should be adopted until the identified deficiencies are rectified.

2. SPRFMO needs to adopt a more clearly defined bottom fishing impact management framework, with a quantitative impact-based performance metric, consistent with the legal framework of the Convention and existing science advice.

3. Until that framework is in place and the impact assessment has been updated, no further changes to CMM-03 should be adopted relating to move on rules, encounter protocols, or additional spatial fishery closures.

4. If SPRFMO pushes ahead with changes to CMM-03 that are scientifically and legally indefensible, and contrary to standards already adopted, this action will set dangerous precedents for other fisheries, and will risk undermining the foundational principles of SPRFMO.

5. SPRFMO needs a glossary of bottom fishing terms to prevent scientific ambiguity or manipulation that may otherwise arise again in future.

6. The science needed to resolve the issues identified here is clearly described, and easily deliverable on a 1-2 year timeframe, using existing data.

Background

The High Seas Fisheries Group (HSFG) has previously highlighted a large and growing imbalance in the SPRFMO approach to managing the impact of bottom fisheries on VMEs, whereby the ability of existing bottom fisheries to continue to operate is steadily eroded on an almost annual basis, to the point that it has become very risky (commercially and operationally) for vessels from any country to operate in this fishery. Additional restrictions on bottom trawling within the open areas are not scientifically or legally justified.

This trend within SPRFMO to progressively close more and more areas to bottom fishing is generally justified by its proponents by citing 'uncertainty' and the need for 'precaution' to protect VMEs (as required by Art 6 of the Convention), but this argument ignores the *undeniable certainty* that:

i) VME habitats across the overwhelming majority of the SPRFMO convention area are in a highly intact state at present; and
ii) Bottom fishing is already prohibited in the vast majority of that area, such that the risk of further impacts in most locations is zero.

We have repeatedly pointed out that **0.019%** of the SPRFMO area is accessible to bottom trawling, and bottom trawling is already prohibited in more than **99%** of the convention area.

Furthermore we have repeatedly pointed out that even within areas open to fishing (with a move on rule), the actual fishery footprint is confined to a small proportion of the fishable area, and vessels tend to fish within the bounds of the previously fished footprint (i.e. trawling in locations that have already been impacted). We have emphasised that for this reason the marginal impact of additional fishing events is low if fishing continues within areas currently open to fishing, and the effect of displacing fishing into new locations (through new closures or via the move on rule) will be to increase rather than decrease the level of impact on benthic habitats, including VMEs.

We reiterate that enacting additional closures, or additional restrictions on bottom trawling within the open areas, is not scientifically or legally justified. The closures and restrictions already in place reflect a flawed process, namely:

i) At the time of the closures SPRFMO relied on a vague and incompletely defined bottom fishing impact management framework *without a quantitative performance metric*, under which it is not possible to judge whether *any* spatial management regime is succeeding or failing;
ii) Different SPRFMO bodies addressing bottom fishing measures sometimes (perhaps inadvertently) changed or distorted the meaning of words already used in adopted scientific advice and/or Convention language;
iii) SPRFMO adopted a progressively narrower spatial focus whereby bottom fishing impacts were only considered within very small impacted areas while ignoring the unimpacted status of surrounding areas.

iv) SPRFMO justified new closures with reference only to 'uncertainty' while resisting HSFG requests and constructive advice to deliver science that would reduce that uncertainty, despite these science approaches being affordable and achievable on a short time-frame, using currently available data.

As in previous years, the HSFG warns that this approach is neither logically nor legally defensible under the SPRFMO Convention, and is inconsistent with current scientific advice.

Echoing our concerns about the absence of a coherent management framework, the SPRFMO SC noted three years ago (SC 7 Report Para 157), that "*there are a number of unresolved issues, particularly regarding the definitions of SAIs and VMEs, and relevant questions of scale, and that SPRFMO in isolation is currently unable to resolve these issues*". The SC recommended that SPRFMO cooperate with other RFMOs to refine these terms and develop guidelines on the appropriate scale of consideration and assessment of SAIs on VMEs.

But instead of actioning this advice to define the operational terms and then implement a clear bottom fishing management framework, SPRFMO has instead imposed major spatial fishing closures, and is considering advice to require additional closures, while these critical definitional questions remained unresolved, including the definition of SAI and the spatial scale at which impacts should be assessed.

We fear this approach, if followed in other RFMOs risks setting a dangerous precedent that is open to challenge in ITLOS. The HSFG states that the continued adoption of the current approach and deviation from sound scientific principles risks undermining the foundational principles of the SPRFMO Convention, which include "to ensure the long-term conservation and sustainable use of fishery resources".

It is clear to HSFG members that some members within SPRFMO are intent on ending bottom trawling in the SPRFMO area. The only countries that have participated over the last decade were New Zealand and Australia, the latter with only very little effort (we could include other nations but that would depend on how we define bottom fishing; the current definition in SPRFMO context is ill-defined and nonsensical. We made this clear from the time the SPRFMO proposed to classify 'midwater trawling' as bottom fishing, but it seems some members are intent on wielding benthic impacts as a pretence to eliminate all trawling on the high seas).

HSFG submissions over more than a decade have provided constructive advice, options and solutions, but we have for the most part been ignored. We have said that it will cost jobs and restrict food production, and it has done that. *If it is some members' aim to put more restrictive measures on the remaining fishery, with very low impacts even at the scale of less than 1% of the SPRFMO area that is open to bottom fishing, then all industry should be very concerned as to the future of bottom fishing all around the globe, including inside their respective EEZs. It is frankly farcical when we consider what we present below, that members*

are actually pushing for more stringent controls in FMAs where impacts are demonstrably negligible, relying on misleading metrics that are in clear defiance of the Bottom Fisheries Impact Assessment Standard already adopted by the SPRFMO Commission.

HSFG notes that if we applied the same illogical restrictions on land as some members are forcing upon SPRFMO industry members, we would be laughed out of the room. Without any other logical explanation, one is tempted to question whether the actual agenda is simply to curtail high seas food production for its own sake. *HSFG stands in open opposition to any such agenda, and demands that the proponents of any further fisheries restrictions be required to make their logic clear, show their math in a transparent manner, and adhere to the same scientific and legal standards that SPRFMO and the rest of the international community have adopted in the past, lest they be accused of manipulating or ignoring the best available science for some other purpose.*

Overview of this paper

HSFG has no desire to critique the work of SPRFMO without proposing constructive solutions, and providing assistance in delivering those solutions. To that end in this paper we will provide:

1. A legal and scientific critique of the new bottom fishing impacts management approach adopted by SPRFMO since 2020 and in the new IWG spatial management recommendations;

2. An outline of a conceptually clarified management framework with a quantitative performance metric to determine how much impact is 'too much', therefore how much 'protection' is required, consistent with international requirements and the SPRFMO impact assessment standard;

3. HSFG response to other IWG advice

4. A draft glossary of terms commonly used in the management of bottom fishing impacts, to avoid a shifting baseline whereby the meaning of agreed terminology changes as the words are misused or redefined;

5. A proposed workplan of updated science outputs necessary to design a rational and defensible bottom fishing framework consistent with current advice and Convention language, noting that the necessary science is readily achievable in 1-2 years, using currently available datasets together with a note of caution regarding likely perverse outcomes, whereby it is likely that the VME move-on rule is resulting in increased rather than decreased impact on VME habitats.

1.0 The IWG has recommended adoption of a problematic new approach to the SPRFMO bottom fishing spatial management framework, inconsistent with the approach taken until 2020

HSFG argues that some of the new advice arising from the SPRFMO bottom fishing Intersessional Working Group (IWG 2023) to modify CMM-03 is neither legally nor scientifically defensible.

Upon reviewing the development of the science informing management of bottom fishing impacts in SPRFMO to date, it appears that that SPRFMO was initially committed to developing a defensible evidence-based approach up until the publication of the Bottom Fisheries Impact Assessment (BFIA) in 2020, but since that time has abruptly changed course. Specifically, some of the advice of the IWG to modify CMM-03 (under 'Topic 2, spatial management') abandons the previously agreed impact assessment approach in favour of a new approach based on VME 'protection' *without reference to 'preventing significant adverse impacts on VMEs'.*

We are concerned that there is little or no legal basis in the text of the convention or in international law that supports this significant change in approach. The FAO (2008) Deep-sea Guidelines reflect the requirement of UNGA Resolution 61/105 to 'prevent significant adverse impacts' (SAI) on VMEs. *There is no reference in UNGA or the FAO to 'protection' (i.e. spatial fishery closures), except as a means to prevent SAI.* The *objective* is to prevent SAI; spatial protection is then a means to that end, not an end in itself.

1.1 Chronology

In support of our statement above, it is instructive to have regard to the chronology of the development of the SPRFMO bottom fishing impact management framework to date:

- In 2019 the Bottom Fisheries Impact Assessment Standard (BFIAS) outlined the means by which SPRFMO shall meet the obligations of the FAO and UNGA to prevent SAI on VMEs. *This standard states clearly that impact assessments should include quantitative estimates of the intensity, spatial extent, and cumulative impact of bottom fishing on VME taxa or habitats, to derive absolute estimates of status* (see section 1.3.5 of SC7-DW19rev, summarised in section 1.3 below).

- In 2019 the SC (SC7 paragraph 172)

  > *Recommended to the Commission that the revised BFIAS at Annex A (of SC07-DW19) be adopted for any relevant BFIA processes undertaken in accordance with CMM 03-2019 and CMM 13-2019.*

- In 2020 the New Zealand-Australia Bottom Fisheries Impact Assessment (BFIA; SC8-DW07rev1) provided quantitative estimates of cumulative impact and VME status for ten VME taxa. However, without agreement

about the spatial scale at which impact should be assessed, and without a quantitative operational definition of SAI, it was not yet possible to use these impact estimates to evaluate the risk of SAI.

- In 2020 the SC (SC8 paragraph 73):

> *agreed that the cumulative BFIA provided by New Zealand and Australia represents: **the best science available to the SC at the current time**; provides a sound basis for formulating management advice to the Commission; meets international standards (such as the FAO Deep-Seas Guidelines) **and complies with the SPRFMO BFIA Standard and**, consequently**, accepts the BFIA** (SC8-DW07_rev1, emphasis added).*

… and… (SC8 paragraph 74)

> *Recommended that the Commission provides guidance to the SC on the level of protection, structure, or function of VMEs it requires **to assure that Significant Adverse Impacts on VMEs are prevented** [emphasis added]*

- In 2021 the SC (SC9 paragraph 78):

> *Noted that ecologically relevant spatial scales for assessing protection levels **to prevent SAIs on VME indicator taxa** still remain to be agreed, but that the existing information at the FMA is likely to be a more biologically appropriate compared with larger scales [emphasis added]*

- In 2022 the SC (SC10 paragraph 138):

a. *requested that the Commission provides clear guidance to the SC on the spatial scale at which significant adverse impacts should be evaluated, and other matters related to operationalising **the objective of preventing significant adverse impacts on VMEs** [emphasis added]*
b. *noting the reference in CMM 03-2022 to the United Nations General Assembly (UNGA) Resolution 61/105 calling on RFMOs to avoid significant adverse impacts on VMEs, SC10 requests that the Commission develop specific objectives for VME management and **provide clarity on the choice of an operational / quantitative threshold defining what level of impact would constitute a significant adverse impact** [emphasis added]*
d. *requested further clarification on the acceptable severity (significance of the damage) and extent (spatial proportion of the VME habitat impacted) of the impact, if these differ from the guidelines provided by the FAO*

- In 2022 (but subsequent to the advice of the SC) the bottom fishing IWG (2023) finalised its advice to the Commission, including the following:

Recommendation 5: The Commission should accept the advice of SC10 (2022) to provide guidance on the spatial scale at which SAIs should be evaluated, and to develop specific objectives for VME management and provide clarity on the choice of an operational/quantitative threshold defining what level of impact would constitute an SAI.

Recommendation 6: The Commission should apply a minimum level of protection of suitable habitat for each modelled VME indicator taxa. Members should work over 2023 to develop new candidate management area boundaries that achieve that level of protection…

1.2 IWG Topic 2: Spatial management scenarios.

The HSFG supports the advice in IWG Recommendations 3-5, noting that to be consistent with SC advice, fulfilling Recommendation 5 is a precondition for determining how much additional protection is required (if any) in different locations.

We do not support the first sentence of recommendation 6 (above), and note that recommendations 5 and 6 actually refer to two distinct and incompatible approaches, of which only the former approach is legally and scientifically consistent with the SPRFMO approach to date. We repeat our objections to the latter approach (also registered formally in our input to the IWG) as follows:

In Recommendation 6 (and its supporting material in Topic 2, summarised in paragraphs 84-96) the IWG proposes to modify CMM-03 to require a commitment to a uniform minimum level of VME 'protection' -- *but without reference to impact*. This approach does not meet the clearly stated requirements of the BFIAS, and effectively abandons the entire impact assessment approach to which SPRFMO had been committed up until at least 2020. *It is not defensible that SPRFMO would first adopt and then abruptly abandon the Bottom Fisheries Impact Assessment Standard which has already been adopted by the Commission.*

The changed approach is also inconsistent with SPRFMO SC advice subsequent to the adoption of the BFIAS, and with the requirements of the UNGA Convention and the FAO. For example, in every instance where 'protection' is mentioned in SC advice, it is a **means** to prevent SAI on VMEs (see bolded text in excerpts above); 'protection' is never an objective in its own right. *The **objective** is the prevention of SAI,* not the establishment of fishery closed areas without reference to impact. The FAO and UNGA requirements also refer only to managing impact to prevent SAI, not ensuring 'protection'.

In this context the IWG Recommendation 6 is illogical, because the level of protection required can only be determined by comparing actual impacts against whatever level of impact that would constitute SAI (a threshold that has not yet to be defined, as highlighted in the IWG recommendation 5). *There can be no legal basis for requiring a uniform level of 'protection' unrelated to the level of impact*: where impacts are high, more protection will be required; where impacts are negligible or low, no new protection is required. Logically, once the SAI threshold has been defined, different protection levels will emerge from the

updated impact assessment, but this cannot be determined without reference to specific impact assessment results.

1.3 BFIAS

The SPRFMO 'Bottom Fisheries Impact Assessment Standard' includes the following requirements (see SC7-DW19rev, section 1.3.5).

Determining the level of risk to benthic habitats, biodiversity and VMEs for each hazard should be based on quantifiable criteria where possible…. Criteria that should be considered are [emphasis added]:

> *Intensity – The intensity or severity of the impact. …* ***should, where possible, be based on quantitative measures derived from impact assessment methods that have been applied successfully elsewhere*** *(e.g. Sharp et al. 2009, Ellis et al. 2014; Pitcher et al. 2016).*
>
> *Spatial extent – The spatial* ***impact*** *relative to the extent of VME indicator taxa (****e.g. will fishing impact 5%, 30% or 80% of the VME indicator taxa distribution)***
>
> *Cumulative impact – The frequency of the impact will influence the risk…* ***This will depend on the amount of fishing effort and should be considered in relation to the recovery of the VMEs/taxa.***
>
> *Overall risk – The overall risk ranking of an activity is evaluated from the combination of the criteria used. The method for combining these criteria ….* ***preferably, to derive absolute estimates of status****…*

Each of these requirements of the BFIAS – i.e. *quantitative estimates of impact intensity, spatial extent, cumulative impact, and absolute VME status*, were generated in the BFIA in 2020, but were de-emphasized by only displaying the outputs in an appendix (and have not been updated). Since that time they have not been used or even referenced again, including in the material supporting the IWG Topic 2 advice regarding spatial protection. Instead, the IWG report utilises other summary statistics about protection (but unrelated to impact) which were also included in the BFIA but that *do not meet the requirements of the BFIAS*.

On this basis SPRFMO should reject Recommendation 6 and focus on fulfilling the requirements of Recommendation 5, then updating the BFIA to produce updated estimates of cumulative impact and VME status in order to determine how much additional protection is required. This is the approach recommended by the SC up until 2020, and committed to by the SPRFMO Commission under the BFIAS.

2.0 SPRFMO needs a more clearly defined bottom fishing impact management framework, with reference to a quantitative impact-based performance metric, and consistent with the existing legal framework

We propose the following simple pathway to guide and clarify a rational evidence-based bottom fishery impact management framework, consistent with the legal requirements of the SPRFMO convention and with scientific advice to date.

- Points 2.1 and 2.4-2.6 have been largely implemented already, culminating in the BFIA (SC8-DW07rev1);

- Point 2.2 has so far prevented implementation of the framework pending guidance from Commission, but with that guidance can be delivered in the coming year

- Likewise, points 2.3 and 2.7-2.11 are readily deliverable in the coming year;

- Points 2.12-2.14 highlight some of the dangers we foresee if SPRFMO uncritically adopts a different approach inconsistent with sound scientific and with legal frameworks applied successfully in the past (and in other international forums).

2.1 SPRFMO already has a conceptual definition of a bottom fisheries management objective: "prevent significant adverse impacts on VMEs"

All fisheries management organisations, both internationally and within national jurisdictions, define and rely upon a balance between the values of ecosystem protection on the one hand, and the rational and sustainable utilisation of marine resources on the other. The definition of, and commitment to, this balance is generally encoded in national legislation or in the founding documents of various international agreements or conventions, and it is the case with SPRFMO.

For bottom fishing impacts, UNGA resolution 61/105 requires that RFMOs "prevent significant adverse impacts on VMEs". The FAO Deep-Sea Guidelines (FAO 2008 paragraph 17) characterise 'significant adverse impacts' as follows:

> *Significant adverse impacts are those that compromise ecosystem integrity (i.e. ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts should be evaluated individually, in combination and cumulatively.*

At its most basic level the FAO definition implies the following:

- *Some level of impact is acceptable,* but impacts above a particular threshold (labelled 'SAI') are not acceptable.
- To qualify as SAI, an impact needs to be of sufficient magnitude to 'compromise ecosystem integrity'
- Restrictions on fisheries are required to ensure that the level of impact remains below the SAI threshold.
- 'Protection' (i.e. closed areas) are an effective tool to reduce or manage bottom fishing impacts, but they are not the only possible tool.
- *The nature and amount of fisheries restrictions required depends on how much impact the fishery is having*: fisheries that have no impact on VME

habitats (e.g. pelagic fisheries) do not need to be restricted at all under the bottom fishing measure; fishing methods that have larger impacts (bottom trawling) will require higher levels of protection, relative to methods that have smaller impacts (bottom longlining), in order to maintain impacts below the SAI level

2.2 SPRFMO needs a quantitative, operational definition of 'SAI'

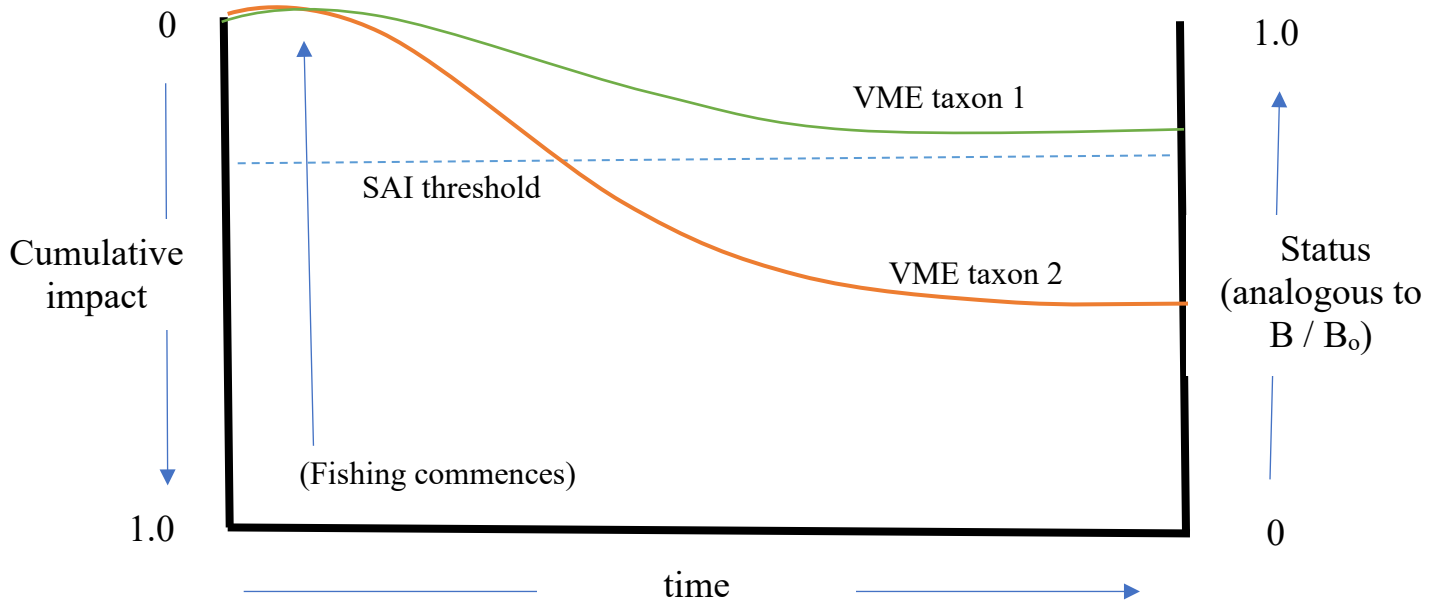
The FAO text provides conceptual guidance to help evaluate whether the effects of fishing in a particular location are high enough to constitute SAI. However the Scientific Committee has recognised that in order to implement an evidence-based framework to manage bottom fishing impacts, it is necessary to translate this conceptual definition of SAI into a practical, quantitative metric against which actual impacts can estimated and compared.

> *"noting the reference in CMM 03-2022 to the United Nations General Assembly (UNGA) Resolution 61/105 calling on RFMOs to prevent significant adverse impacts on VMEs, SC10 requests that the Commission develop specific objectives for VME management and provide clarity on the choice of an operational / quantitative threshold defining what level of impact would constitute a significant adverse impact." (SC10, paragraph 138b)*

Conceptually, an operational definition of the SAI threshold level can be illustrated as in Figure 1. In this hypothetical diagram, bottom fishing impacts accumulate over time, reducing the intact status of VME taxa over time until they reach an equilibrium status (where the rate of impact is balanced by the rate of recovery). The SAI threshold is illustrated as a horizontal line; taxa for which the equilibrium status is estimated or projected to fall below the SAI level require management intervention to prevent SAI.

There is no completely objective basis to define what proportion of a benthic taxon or habitat can be damaged before the impact will '*compromise ecosystem integrity',* but precedents from other forums may be helpful. For example the Marine Stewardship Council (2022) defines 'serious or irreversible harm' as a reduction in the habitat structure and function (i.e., 'status') below 80% of the unimpacted level (unless recovery can occur in less than 20 years).

Figure 1. Conceptual illustration of impacts accruing and reducing the status of VME taxa over time (assuming constant fishing effort). Equilibrium status is reached when incremental impacts are balanced by the rate of recovery. In this example, VME taxon 2 is projected to drop below the SAI level, requiring management intervention to prevent SAI. VME taxon 1 is projected to stabilize at a status level higher than SAI, and requires no intervention.



- **Impact** in this figure refers to physical damage to benthic habitats (including VME taxa) in locations where bottom fishing gear makes contact with the sea floor.

- **Status** in this figure refers to the proportion of the VME taxon or habitat that is intact or undamaged.
  - Conceptually, status = (1 minus cumulative impact); as impact increases, status decreases.
  - The concept of status also includes recovery (i.e. status can also increase over time) but for benthic organisms, recovery is often slow.

- **'SAI threshold'** is the threshold defining how far the status can be reduced before the impact is considered to be 'too high'. In this framework SAI can be expressed as a number between 0 and 1. An SAI threshold of .80 would imply that the maximum acceptable cumulative impact is .20

Definition of a quantitative SAI threshold is analogous to defining a target or limit biomass or exploitation rate in fisheries (expressed proportional to the unimpacted state, e.g. B_{msy} / B_o or B_{mey} / B_o).

Without this threshold being defined in a quantitative way, it is not possible to assert how much bottom fishing impact is 'too much'. It is not scientifically, logically or legally defensible for SPRFMO to continue imposing new management measures without defining an operational threshold; it would be the equivalent of managing a target fishery without defining how much reduction in fish biomass is allowed.

2.3 It may be that different choices of the SAI threshold are justified for different VME taxa, reflecting biological properties

The FAO Deep-Sea Guidelines (FAO 2008 paragraph 18) state:

> *18. When determining the scale and significance of an impact, the following six factors should*
> *be considered:*
> *i. the intensity or severity of the impact at the specific site being affected;*
> *ii. the spatial extent of the impact relative to the availability of the habitat type affected;*
> *iii the sensitivity/vulnerability of the ecosystem to the impact;*
> *iv. the ability of an ecosystem to recover from harm, and the rate of such recovery;*
> *v. the extent to which ecosystem functions may be altered by the impact; and*
> *vi. the timing and duration of the impact relative to the period in which a species needs the habitat during one or more of its life-history stages.*

Most of these considerations are reflected in the choice of which benthic taxa are considered to be VME indicator taxa, but to reflect the recommendations regarding recovery time, it would be logical to define a higher SAI threshold for slower-growing taxa, and a lower SAI threshold for faster-growing taxa. This is analogous in fisheries to allowing a higher exploitation rate for faster-growing fish species, and a low exploitation rate for slow-growing species.

Alternately, the Marine Stewardship Council (2022) defines 'serious or irreversible harm' differently for taxa than can or cannot be expected to recover from impacts in less than 20 years; for slower-growing taxa, the maximum impact threshold is **0.80.**

This is a topic that should be considered by the Scientific Committee.

2.4 SPRFMO requires an estimate of 'current intact status' and a projection of 'equilibrium status' for VME taxa and/or habitats (i.e. we need an updated impact assessment)

To evaluate whether impacts have exceeded or are likely to exceed SAI, it is necessary to assess how much impact has already occurred, and is likely to continue to occur under different management options. I.e. *we require an updated impact assessment*. The vast majority of the necessary scientific work for an impact assessment has already been delivered in the Bottom Fisheries Impact Assessment, BFIA, (SC8-DW07rev1). However, the SC was unable to provide actionable advice at the time that the original BFIA was delivered, because:

2.5 *It is impossible to estimate or refer to either 'impact' or 'status' without defining the spatial scale at which impact and status are summarised*

'Impact' denotes what proportion of a VME habitat has been damaged *in a defined area.* References to impact are meaningless if the area is not defined: the amount of impact occurring from a single trawl fishing event could be as high as 100% (if measured only within the footprint the trawl) and simultaneously so low as to be almost zero (if measured at the scale of a whole ocean basin). When the BFIA was delivered there was no consensus regarding at what spatial scale bottom fishing impacts should be summarised or managed. Without a specified spatial scale, there was no agreed estimate of current status for each VME habitat, and no way of evaluating whether that status is currently above or below any agreed SAI threshold.

Conceptually, there is scientific acknowledgement that impact assessment should occur at 'biologically meaningful scales'. This is analogous to defining the stock structure of a target fish, and then assessing and managing fisheries impacts separately for each stock. This intent is also stated explicitly in the updated BFIAS (SC7-DW19Rev, Appendix B):

> *The unit of analysis for deep-sea fish stocks and other organisms with which bottom fisheries interact, including VMEs, should be the biological stock or population, although data limitations may constrain the unit of analysis to the species, resource assemblage, undersea feature, management unit level or some other spatially delineated unit.*

However, there was no clear consensus regarding the biological 'stock structure' of VME taxa at the time the BFIA was delivered.

Similarly, the SC had previously noted that (SC 7 Report Para 157) "*there are a number of unresolved issues, particularly regarding the definitions of SAIs and VMEs, and relevant questions of scale, and that SPRFMO in isolation is currently unable to resolve these issues*". The SC recommended that SPRFMO cooperate with other RFMOs to refine these terms and develop guidelines on the appropriate scale of consideration and assessment of SAIs on VMEs, but this has not occurred.

The NZ High Court has recently commented that:

> *"An activity that jeopardises the whole of a species or ecosystem, or the whole of one of its constituent parts, may obviously cause material harm to the environment. However, the position is likely to be different where the activity has more limited effect. By way of example, harm to the environment may not be material where the activity jeopardises a species or ecosystem (or one of its constituent parts) in a confined area but the population of that species or ecosystem remains unaffected beyond the confined area"*[1]

It is clear that the spatial scale at which impacts are assessed is critical to any operational definition of SAI, but to date SPRFMO has not resolved this question.

[1] Protect Aotea v Environmental Protection Authority, [2022] NZHC 1689 (2022), Paras 46-48

Advice has now emerged from the bottom fishing IWG (2023) regarding the appropriate scale at which to assess and manage bottom fishing impacts:

> *… [the SC] noted that the SPRFMO Intersessional Working Group on Bottom Fishing has concluded that the Commission should adopt the Fishery Management Area as the appropriate scale for assessing the performance of spatial management (including the areas that are open and closed to fishing) and that the assessment of VME encounters should be at biologically relevant spatial scales. (SC10, paragraph 138c)*

2.6 If the FMA spatial scale is adopted for bottom fisheries impact assessment, then preliminary estimates of VME status for 10 VME taxa already exist.

The original results of the BFIA at the FMA scale are shown in Appendix 6 of that document (SC8-DW07rev1, Figures A6.1 – A6.9; partially reproduced here in Figure 2). If Commission agrees with the IWG advice to assess VME impacts at the FMA scale, then *these figures from Appendix 6 represent the best available science regarding the impacts of bottom fishing in the SPRFMO area; and should be used to inform spatial management design.*

Scientific advice from before the results of the BFIA were clear, suggested that VME protection in the three FMAs shown in Figure 2 was '<u>qualitatively</u> <u>less</u> favourable' than elsewhere (SC8 paragraph 73) and this statement has carried through into IWG advice that more fishery closures may be warranted in these areas (IWG report paragraph 85). However the requirements of the BFIAS are clear that wherever possible, *quantitative methods* should be used, including estimates of both *cumulative impact* and *VME taxon status*. Since the publication of the BFIA these quantitative estimates are now available and easily updated; ***there is no need or justification to base spatial management decisions on qualitative or relative statements that are incompatible with the BFIAS.***

2.7 Best available estimates of cumulative impact and status reveal very low or even negligible impacts in most FMAs, including some FMAs where increased spatial fishery closures are proposed

Even a cursory analysis of the BFIA impact estimates at the FMA scale reveals that, according to the best available science produced by SPRFMO members and universally approved by the SC, cumulative impacts are very low, such that *there is no scientific or legal basis for further fishery closures in the vast majority of SPRFMO bottom fishery FMAs.*

Note in particular the results highlighted in Figure 2 for the Southern Louisville FMA (center plot). The BFIA estimates *that even if current fishing effort levels were to continue indefinitely, VME status will remain* ***>99% intact for every single VME taxon for which estimates are available.***

- What **reasonable person** would assert that reducing the intact status of a marine organism by less than 1% will somehow 'compromise ecosystem integrity' (FAO 2008 paragraph 17) and therefore constitute a 'significant adverse impact'?

- What **reasonable fishing nation** would be willing to adopt this same standard inside its own EEZ?

- What would be the effect on other SPRFMO fisheries if the same maximum impact threshold were set for other non-target species such as sharks or seabirds or non-target fish?

Note also that even in the more 'heavily' impacted FMAs (e.g. Northwest Challenger, right-hand plot in Figure 2) the most heavily impacted VME taxa will remain above 90-95% status under current fishing effort patterns.

2.8 The impact figures in SC8-DW07rev1 Figures A6.1 – A6.9 should be updated before new spatial management boundaries are proposed

The SC (e.g. SC9 paragraph 74) and IWG (Recommendation 6) both advise that the BFIA should be updated with the best available information and then used to inform the design of bottom fishing measures. In particular, modelled spatial distributions are now available for all 17 VME indicator taxa listed in Annex 5 of CMM 03-2022, but the BFIA has not been applied to estimate equilibrium status for the 7 newest taxa for which distributions were only reviewed for the first time at SC10. (SC10 paragraph 119-122). If the new distributions are shown to be useful, then impact and status figures such as those reproduced below in Figure 2 should be expanded to include these new taxa.

Furthermore, the BFIA produces estimates of future VME status based on different projections of future fishing effort. If orange roughy TAC's within these bottom fishing FMAs are changed in 2023, then the projections in *the BFIA will no longer reflect current or expected fishing effort levels, and will overestimate impact*. <u>If the TACs are changed, then the cumulative impact and equilibrium status projections in the BFIA should be updated accordingly.</u>

Finally, the BFIA acknowledges that in locations where tow lines are targeted more precisely than is represented in the fisheries data (due to positional rounding of reported tow positions and the imposition of a 0.5 degree random jitter in the impact assessment stage of the BFIA) then *the impact estimates will over-estimate actual impact and underestimate VME status. This is almost certainly the case for bottom fishing impacts on all seamount features, including all three Louisville Ridge FMAs*.

The extent to which this is also true for the other FMAs is unclear. The BFIA (p 112)_recommended that "*This issue may be investigated in future by examination of more recent data with higher spatial resolution".* <u>This investigation should occur before any new fisheries closures are proposed</u> to address bottom fishing impacts, especially in FMAs with primarily seamount habitats.

The need to update the BFIA impact estimates will not create undue hardship or delays in the work of the SC; it is a relatively simple matter to re-run the previous BFIA using current available data and updated fishing effort projections.

2.9 Once the impact and status estimates arising from the BFIA are updated, these can be used to evaluate and modify existing spatial area closures to achieve whatever SAI threshold is agreed in step 2.2 above.

Any agreed SAI threshold can be portrayed in the BFIA cumulative impact estimates (e.g. in Figure 2 below) as a vertical line. Where impact estimates extend to status levels to the left of this vertical line, this indicates that further protection may be required. Where impact estimates are low, such that status estimates are consistently to the right of that line, this indicates there is no risk of SAI to that taxon, and therefore no justification for additional spatial management measures to prevent SAI.

2.10 *In FMAs where the projected status of every VME taxon is well above the SAI threshold, some existing closed areas should be re-opened consistent with the agreed threshold*

Any principled, evidence-based management framework should be applied equally in all areas, whether the equilibrium status projection is estimated to stabilise either above or below the SAI threshold. Where all current and future impact projections produce status estimates substantially higher than the threshold, this indicates that there is no risk of a significant adverse impact in this location, meaning current fishery closures are more restrictive than necessary.

The equilibrium status estimates in Figure 2 strongly suggest that in some FMAs, the previous closures were larger than required to meet any reasonable definition of the SAI threshold. The effort scenarios labelled 'historical' in the plots in Figure 2 (shown in grey) indicate what the equilibrium status would be if fishing continued in the same locations and at the same levels as occurred in the whole history of the fishery, including prior to the areal closures in 2020. Where the grey bars are to the right of the agreed SAI threshold, this is strong evidence that these areal closures were unnecessary to avoid SAI. It is likely that this will be the case on all Louisville Ridge FMAs, unless the Commission adopts an operational definition of the SAI threshold at or above the 95% level.

2.11 Advice that the SPRFMO Commission abandon a management approach to 'prevent significant adverse impacts' on VMEs in favour of adopting a 'minimum areal protection' threshold is not legally or conceptually defensible

As detailed above, since the presentation of the BFIA in 2020, SPRFMO has abruptly abandoned its commitment to deliver a rational bottom fisheries management framework based on the impact assessment and a commitment to prevent SAI. Recent advice arising from the IWG Topic 2 would instead replace this approach with a commitment to impose spatial fisheries closures over a minimum proportion of each VME distribution, *regardless of actual impact*.

This approach is not consistent with the legal framework of the SPRFMO convention, or with the language of the FAO and the UNGA resolution. The binding commitment regarding VMEs is to 'prevent significant adverse impacts' NOT to 'ensure minimum levels of protection'.

It cannot be argued that the approaches are interchangeable, as if 'protection' is merely the inverse of 'impact'. Specifically:

- *Impact is a function of fishing gear and fishing practices*. A trawl with a 100 m wide footprint will have twice as much impact as a trawl with a 50 m wide footprint. A tow that is in contact with the ocean floor for 1 km will have 10x more impact than a tow that is in contact with the ocean floor for 100 m. In contrast, 'protection' is insensitive to differences in gear and fishing practices.

- *Impact scales directly with the level of fishing effort*. A fishery with 100 vessels will have a higher impact than a fishery with only 10 vessels. A vessel that deploys 100 tows will have higher impact than a vessel that deploys a single tow. In contrast, 'protection' is insensitive to differences in fishing effort.

- *Impact varies between fishing methods*; bottom trawls have higher impacts than bottom longlines (per unit length), so will require more restrictive management to prevent SAI (except perhaps in locations where trawl lengths are very short). In contrast 'protection' is measured and expressed the same for all fishing methods.

Replacing an impact-based performance metric with a protection-based performance metric means that SPRFMO treats all fisheries as if they have equal impact -- regardless of differences in method, gear configuration, fishing practices, or effort levels – and assumes that areal closures are the only way to reduce impact. This approach cannot be defended with reference to the SPRFMO convention or UNGA resolution language.

2.12 Adopting a single benchmark for what proportion of each VME taxon should be closed to bottom fishing in each FMA will produce inconsistent and illogical results.

Even without updating the impact estimates with current available data, it is clear based on examination of the BFIA estimates in Figure 2 that adopting a single 'minimum % protected' standard across all FMAs will produce wildly inconsistent and illogical results: some FMAs would experience additional fishery closures despite having negligible impacts (e.g. with all VME taxa being 98-100% intact) while other FMAs may experience no additional closures despite those same taxa being impacted more heavily.

<u>On what logical basis would SPRFMO impose closed areas to protect a VME taxon that is (and will remain) at 99% status in one FMA, yet consider that a reduction below 80% status is acceptable for the same VME taxon in a different FMA?</u>

These kinds of illogical outcomes are inevitable if SPRFMO adopts a single 'minimum % protected' standard across all bottom fisheries as endorsed in the

IWG recommendation 6; adherence to the BFIAS demands instead that protection by scaled on the basis of an updated impact assessment and a coherent operational definition of SAI.

2.13 Replacing the impact-based performance metric required by the BFIAS with a new protection-based metric will create destabilising precedents for other SPRFMO fisheries and in other RFMOs, and will disincentivise effective mitigation

HSFG urges other fishing countries to consider the effect that adopting this new approach to managing bottom fishing impacts would have if the same precedent were applied to other kinds of impacts in other fisheries. Application of this same precedent to other fisheries impacts would logically lead to outcomes such as the following:

- For seabirds: *"It doesn't matter how few seabirds your fishery actually captures; because captures are not zero, we need to prohibit longline fishing in 70% of the area inhabited by seabirds".*

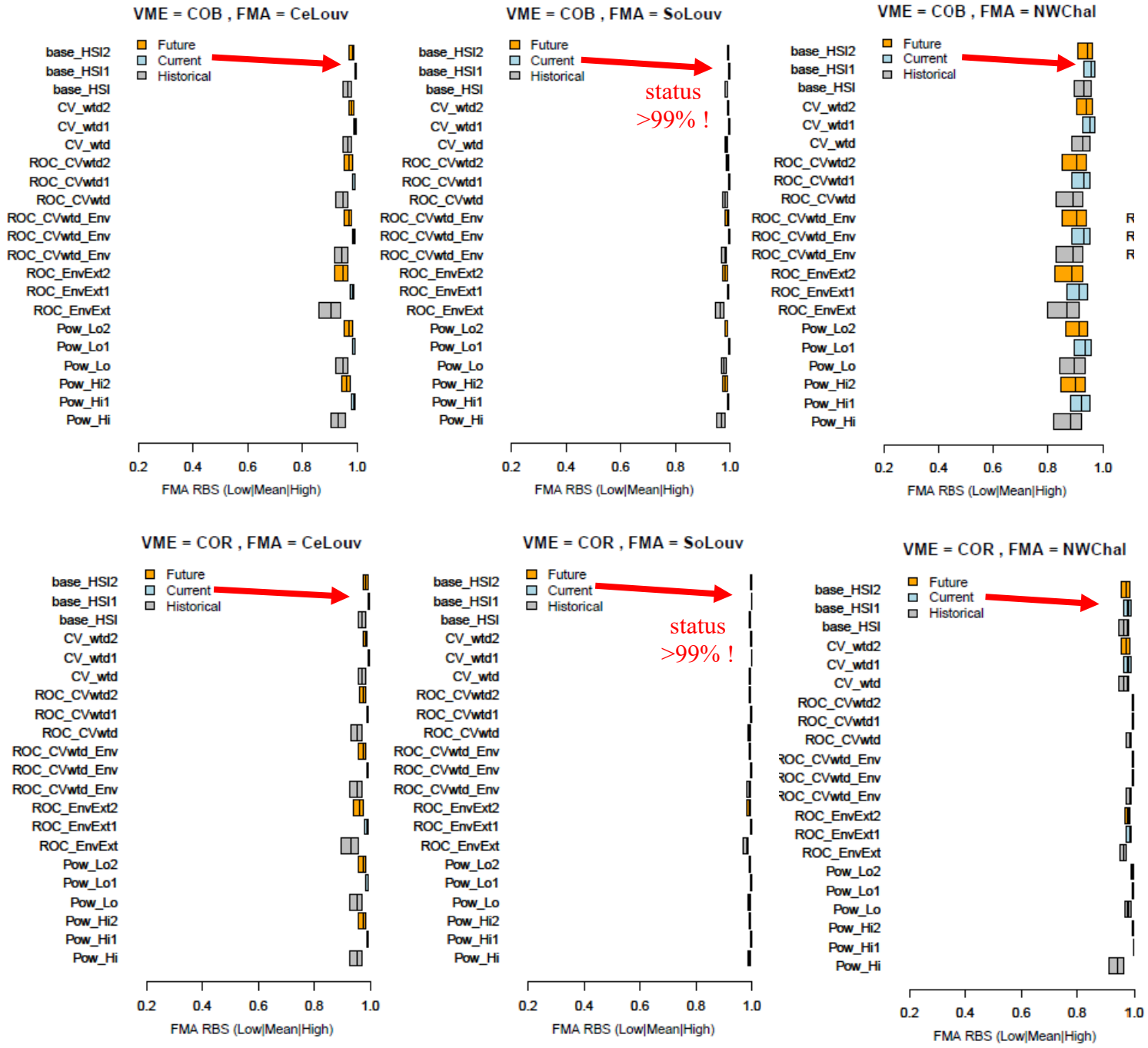
- For marine mammals: *"It doesn't matter that improved fishing methods have reduced the bycatch rate of marine mammals to negligible levels relative to historical impacts; because historical impacts occurred, we need to prohibit fishing in 70% of the spatial distribution of each mammal species."*

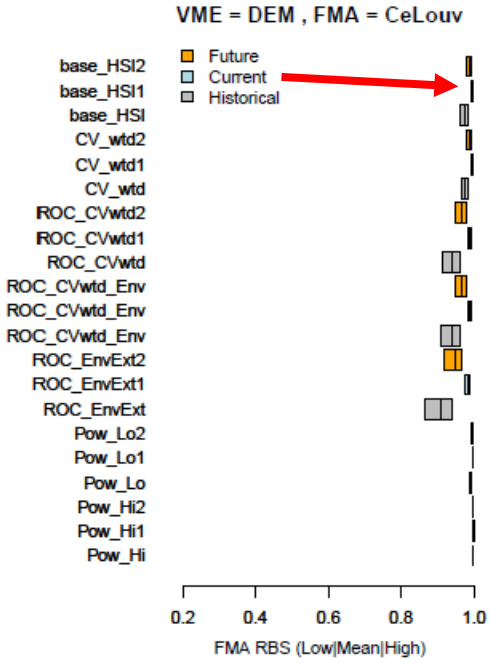
- For non-target fish: *"It doesn't matter that non-target fish populations are stable at high population status relative to B_0; we need to prohibit fishing within 70% of the spatial distribution of all non-target fish."*

We are all aware there are groups that would welcome this kind of approach, as their stated aim is to end high seas fishing as we know it (many of these groups are on record stating this. However, such an approach is contrary to the foundational objective of SPRFMO, which includes "to ensure the long-term conservation *and sustainable use* of fishery resources".

Effects on mitigation uptake: Tremendous progress has been made in fisheries management around the world through the adoption of mitigation, new gear technology, and changed fishing methods all designed to reduce **impact.** Abandoning an impact-based performance metric in favour of spatial protection measures affecting all vessels equally (regardless of their impact) would effectively negate any incentive for vessels to continue to develop and deploy low-impact methods or gears. This is contrary to ongoing good fisheries management.

Figure 2. Estimated relative benthic status (RBS) on the Central Louisville Ridge (left), South Louisville Ridge (center) and Northwest Challenger Plateau (right) for each of ten VME taxa for which impact and status assessments are available in the BFIA (SC8-DW07rev1). Note that RBS estimates are of equilibrium status, *i.e they include past and also future impacts, assuming that fishing continues indefinitely* under different assumptions about future effort levels. The base case ('best guess') estimate of equilibrium status, with fishing continuing at current levels, is highlighted with a red arrow. Other estimates illustrate the range of plausible uncertainty under different assumptions about the distributions of VME taxa, or different assumptions about future fishing effort. Figures reproduced from Appendix F, Figures A6.1 – A6.10 in the BFIA (SC8-DW07rev1).

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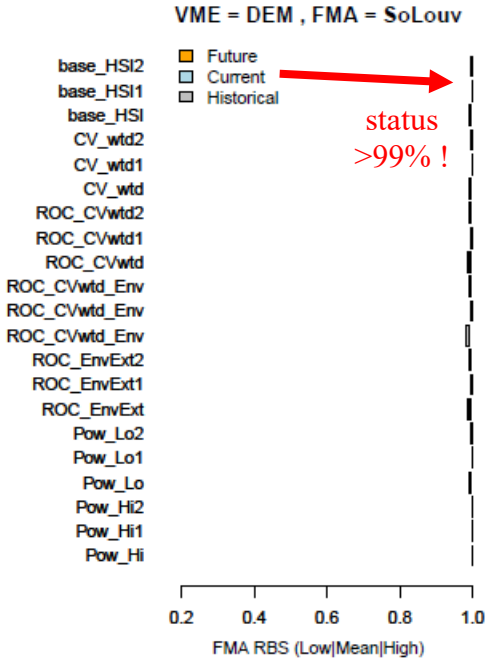
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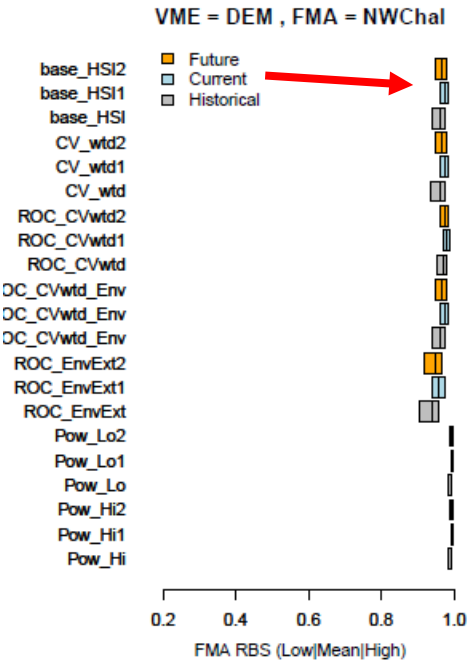
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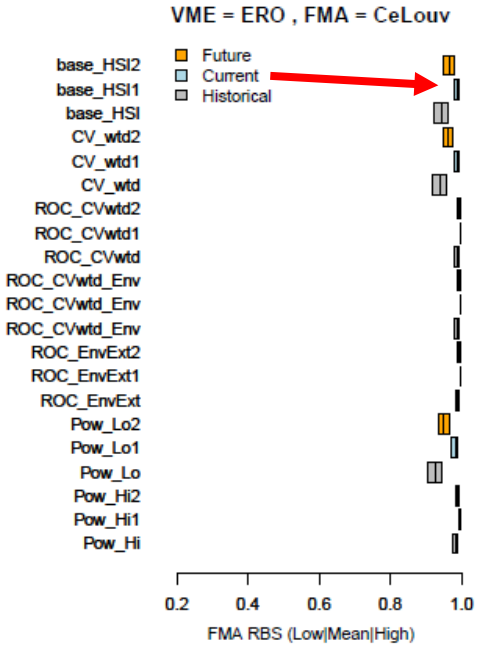
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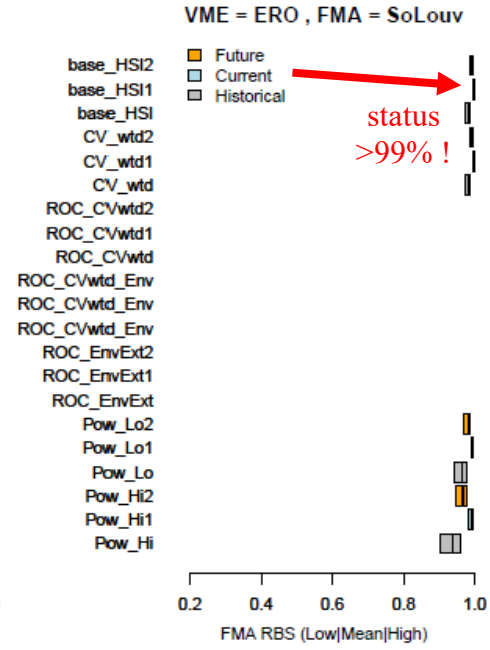
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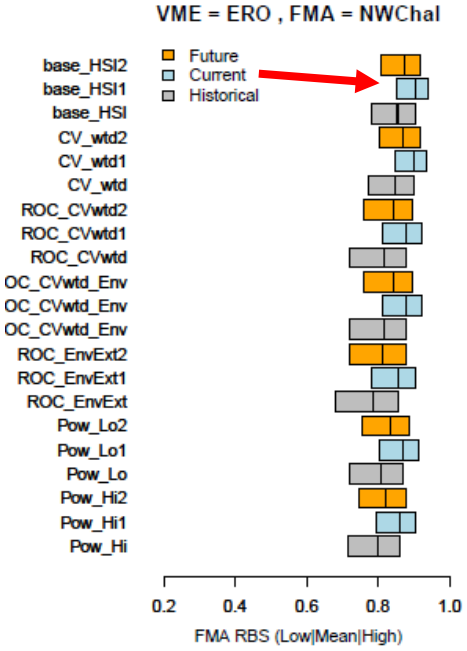
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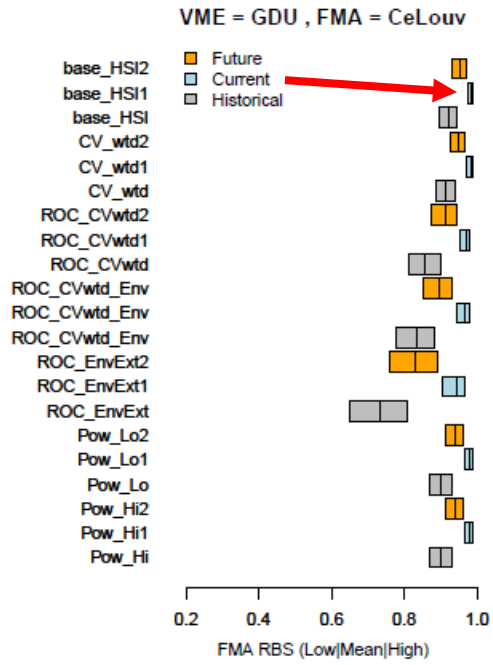
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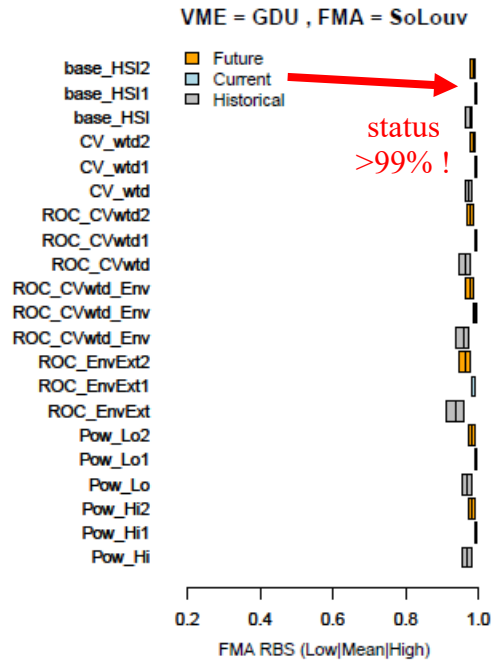
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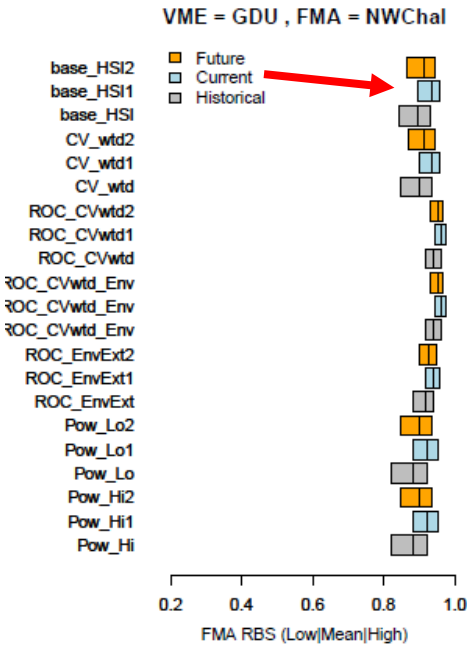
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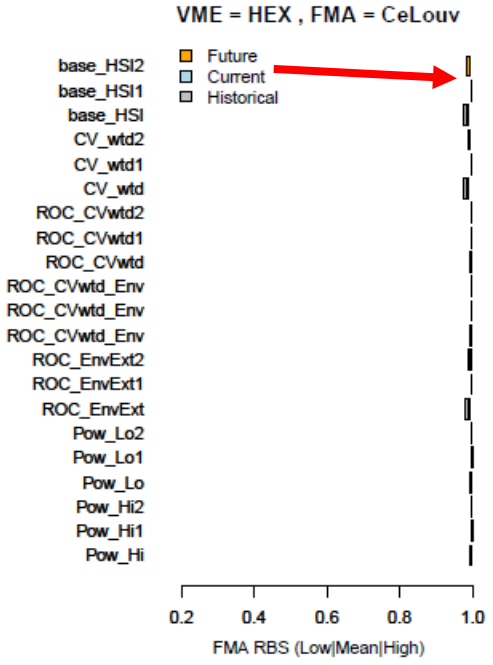
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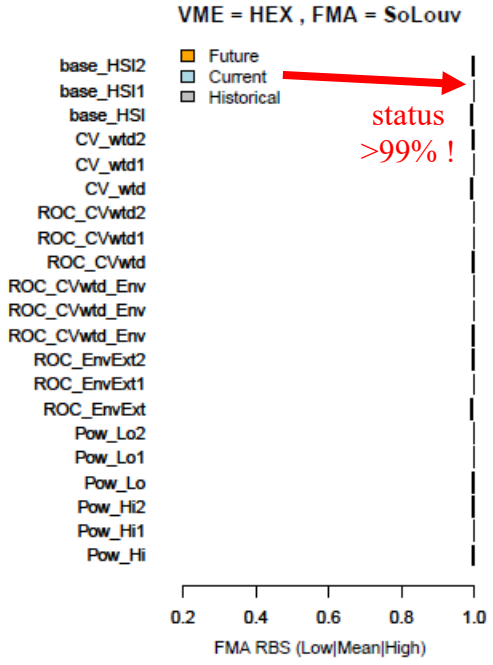
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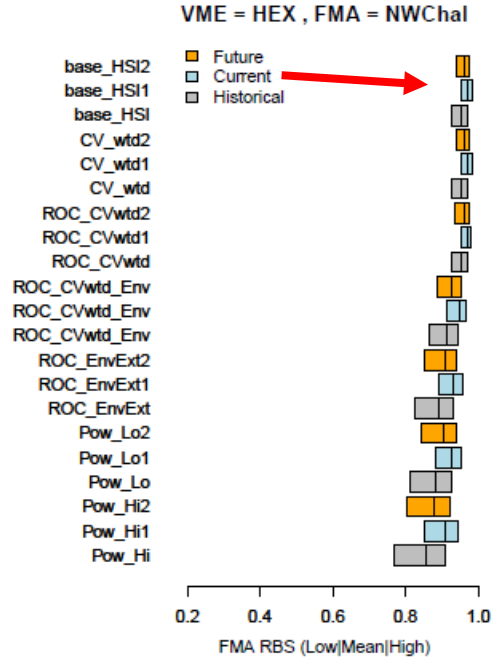
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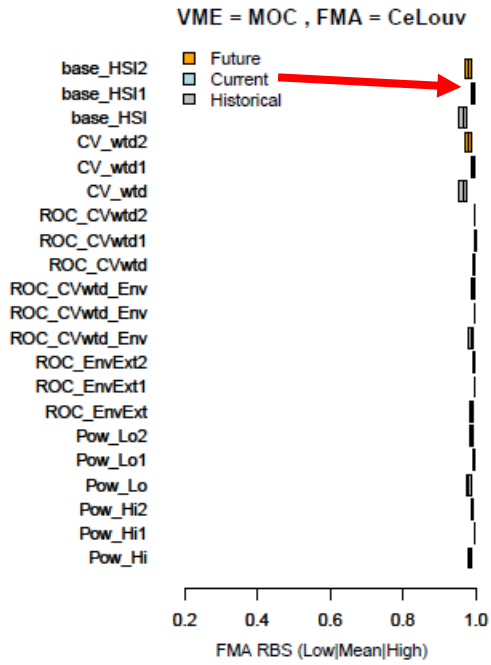
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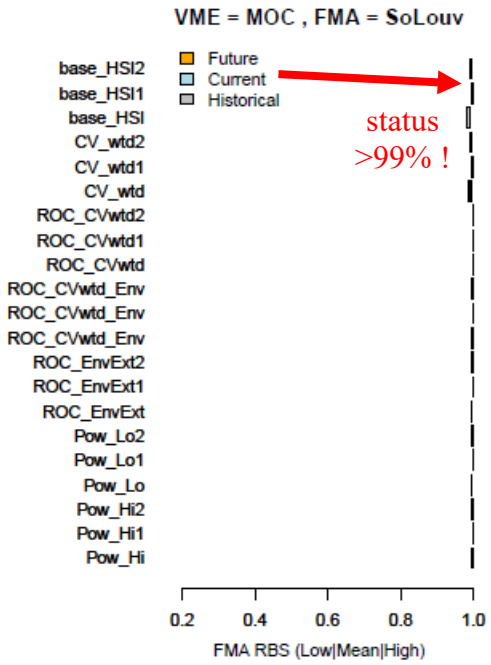
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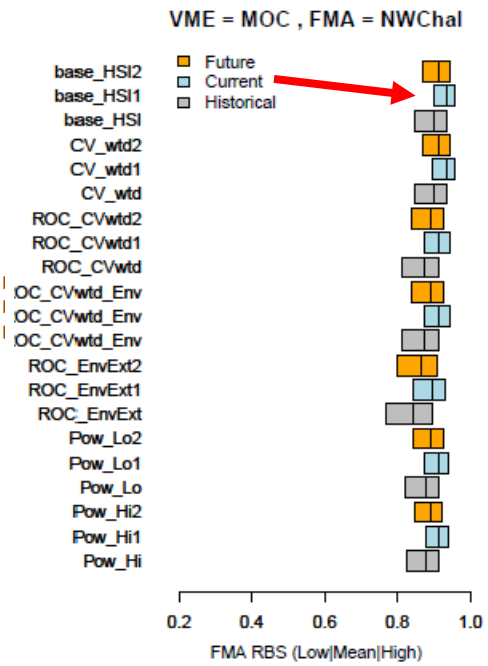
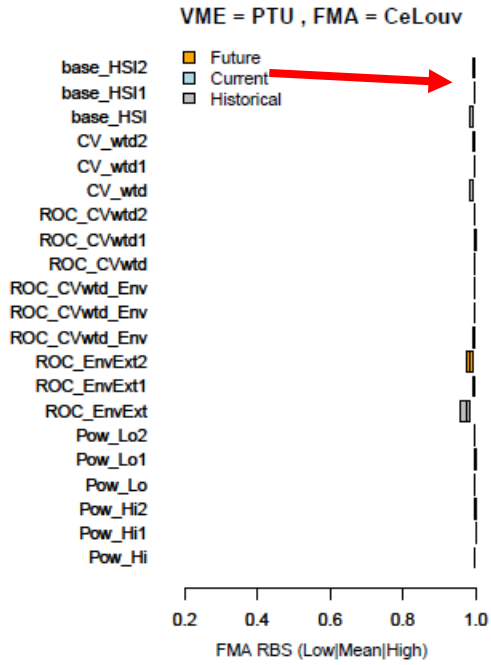
FMA RBS (Low|Mean|High)


VME = MOC , FMA = NWChal
Future
Current
Historical
base_HSI2
base_HSI1
base_HSI
CV_wtd2
CV_wtd1
CV_wtd
ROC_CVwtd2
ROC_CVwtd1
ROC_CVwtd
OC_CVwtd_Env
OC_CVwtd_Env
OC_CVwtd_Env
ROC_EnvExt2
ROC_EnvExt1
ROC_EnvExt
Pow_Lo2
Pow_Lo1
Pow_Lo
Pow_Hi2
Pow_Hi1
Pow_Hi
0.2
0.4
0.6
0.8
1.0
FMA RBS (Low|Mean|High)


VME = PTU , FMA = CeLouv
Future
Current
Historical
base_HSI2
base_HSI1
base_HSI
CV_wtd2
CV_wtd1
CV_wtd
ROC_CVwtd2
ROC_CVwtd1
ROC_CVwtd
ROC_CVwtd_Env
ROC_CVwtd_Env
ROC_CVwtd_Env
ROC_EnvExt2
ROC_EnvExt1
ROC_EnvExt
Pow_Lo2
Pow_Lo1
Pow_Lo
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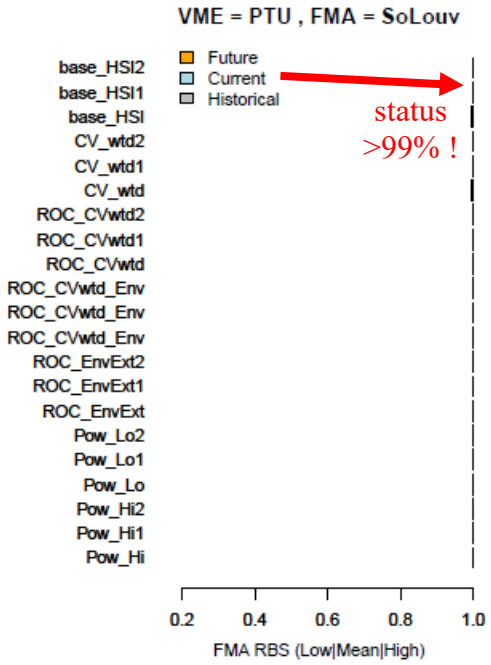
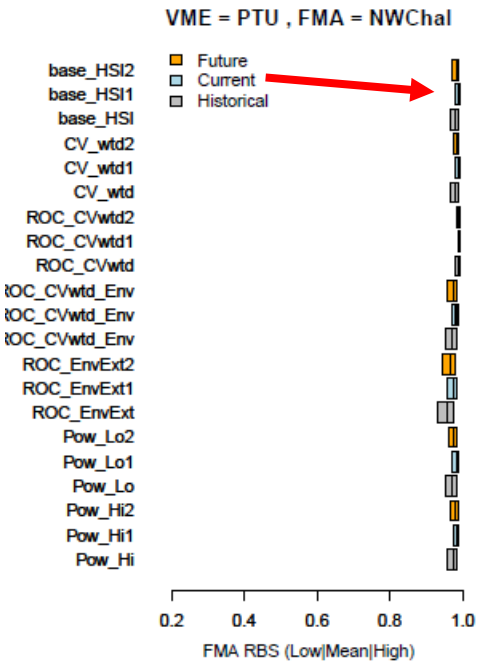
Pow_Hi
0.2
0.4
0.6
0.8
1.0
FMA RBS (Low|Mean|High)


VME = PTU , FMA = SoLouv
Future
Current
Historical
status
>99% !
base_HSI2
base_HSI1
base_HSI
CV_wtd2
CV_wtd1
CV_wtd
ROC_CVwtd2
ROC_CVwtd1
ROC_CVwtd
ROC_CVwtd_Env
ROC_CVwtd_Env
ROC_CVwtd_Env
ROC_EnvExt2
ROC_EnvExt1
ROC_EnvExt
Pow_Lo2
Pow_Lo1
Pow_Lo
Pow_Hi2
Pow_Hi1
Pow_Hi
0.2
0.4
0.6
0.8
1.0
FMA RBS (Low|Mean|High)


VME = PTU , FMA = NWChal
Future
Current
Historical
base_HSI2
base_HSI1
base_HSI
CV_wtd2
CV_wtd1
CV_wtd
ROC_CVwtd2
ROC_CVwtd1
ROC_CVwtd
OC_CVwtd_Env
OC_CVwtd_Env
OC_CVwtd_Env
ROC_EnvExt2
ROC_EnvExt1
ROC_EnvExt
Pow_Lo2
Pow_Lo1
Pow_Lo
Pow_Hi2
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0.2
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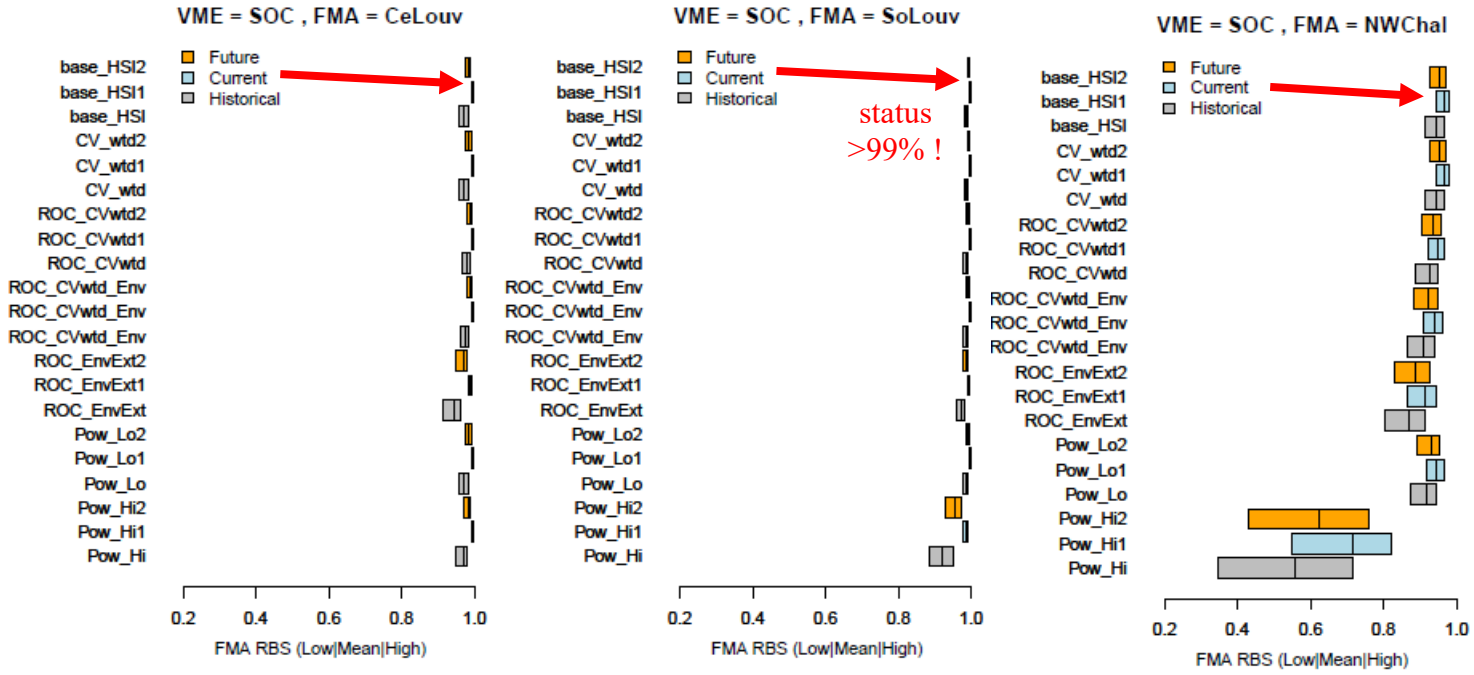
1.0
FMA RBS (Low|Mean|High)


VME = SOC , FMA = CeLouv
VME = SOC , FMA = SoLouv
VME = SOC , FMA = NWChal
Future
Current
Historical
base_HSI2
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base_HSI
CV_wtd2
CV_wtd1
CV_wtd
ROC_CVwtd2
ROC_CVwtd1
ROC_CVwtd
ROC_CVwtd_Env
ROC_CVwtd_Env
ROC_CVwtd_Env
ROC_EnvExt2
ROC_EnvExt1
ROC_EnvExt
Pow_Lo2
Pow_Lo1
Pow_Lo
Pow_Hi2
Pow_Hi1
Pow_Hi
status
>99% !
0.2
0.4
0.6
0.8
1.0
FMA RBS (Low|Mean|High)

3.0 HSFG responds to other IWG advice

3.1 IWG Topic 1: Spatial scale of impact assessment and management.

HSFG generally supports Recommendations 1 and 2 to apply the impact assessments at the FMA scale in order to evaluate the risk of SAI, and the development of a multi-scale assessment approach to deal with possible encounters.

3.2 IWG Topic 3: Move on rule

HSFG repeats and draws attention to the warning in our paper DW10-Obs1 that the move-on rule as currently designed almost certainly serves to **increase** rather than decrease impact on benthic habitats, including VMEs. This is because:

> a. If vessels choose first to fish in historically favoured locations but are displaced by a move-on rule into less favoured locations, they will be moving from a location of high historical impact (i.e., low current VME status) to a location of lower historical impact (hence higher current VME status).
>
> b. If vessels choose first to fish in locations with higher catch per unit effort (CPUE) but are displaced by a move-on rule into locations with lower CPUE, then (in a catch-limited fishery) total effort will increase. All other things being equal, more tows equal greater benthic impact.

In order to overcome the perverse impact-increasing effect of these two factors, for a move on rule to be effective it is critical that:

i) VME patches can be reliably detected, and
ii) the spatial scale of the move-on exclusions is closely aligned with the spatial scale and spatial patch configuration of the VME patches.

Neither of these conditions are met in SPRFMO; the most recent SC advice is that *'the best available estimates are insufficient to yield quantitative estimates of catchability' (*SC10 paragraph 132b). Without understanding catchability it is impossible to understand the prevalence and spatial scale of VME patches using bycatch data, and other available data (e.g. from camera deployments) are too sparse and too expensive for this purpose.

The IWG report (paragraph 132) also warns:

> *132d. If VME catchability for a particular taxon is very close to zero, then move-on rules based on bycatch are likely to be inappropriate for that taxon.*

This means that at least for some VME taxa, and without considerable further research, SPRFMO cannot rely on VME bycatch data to detect and respond to VMEs. Where catchability is poor, imposing move on rules based on VME bycatch is statistically no different that imposing move on rules by rolling dice; and the likely outcome is to increase rather than decrease impacts on VMEs.

HSFG has proposed new research using simulations to test the efficacy of different move on rules under different scenarios (section 5.3 below). Until this work is done, and consistent with Recommendations 7 and 9, we do not support any

changes to the move on rule. The results of this work should then be used to refine trigger thresholds (as opposed to IWG Recommendation 8), or to eliminate the move on rule for taxa where it is likely to be ineffective or counter-productive.

3.3 IWG Topic 4: Encounter protocol

The HSFG notes that the encounter protocol cannot be meaningfully discussed except as it relates to trigger thresholds and the move on rule. In section 3.2 above we have already flagged that the move on rule (as currently implemented) is ludicrous, as it will most often force fishers to move away from trawl tracks that are already impacted and into less heavily impacted and potentially pristine locations. This is neither scientifically sensible nor legally defensible. On that basis the encounter protocol should not be modified until there is evidence that a move on rule can be designed and implemented in a way that will not result in increased impact; the necessary research to address this question is referred below in section 5.3 and described in paper SC10-Obs1 (pp 18-22).

We also note that in discussing the 'encounter protocol', SPRFMO has inadvertently adopted ambiguous and possibly incorrect terminology, inconsistent with the Bottom Fisheries Impact Assessment Standard. The BFIAS states clearly:

> The move-on rule under SPRFMO CMM 03 (Bottom Fishing) applies in cases of any interactions that trigger the specified threshold weights of VME indicator taxa during fishing operations. For new and exploratory fisheries, encounter protocols should be sufficiently precautionary to account for a likely paucity of information on the distribution and characteristics of potential VMEs.
>
> In contrast, 'designating a VME' requires a scientific and deliberative analysis to integrate data from individual or cumulative encounters and assess information on occurrence of VMEs across larger spatial scales, in order to identify, map and designate areas which are considered to constitute actual VMEs. This is to be undertaken in accordance with CMM 03 (Bottom Fishing) paragraphs 32-36.

To avoid ambiguity, bycatch in excess of a designated threshold should probably be labelled a 'trigger event' rather than an 'encounter' because outside this context 'encounter' suggests that the vessel has encountered a VME, whereas the second paragraph above makes clear that the trigger event is only one piece of evidence that contributes to the determination of whether or not a VME has been encountered, which occurs via a separate process.

3.4 IWG Topic 5: Review of 2020 VME encounter

HSFG declines to comment on this subject as one of its members involved in the encounter which is currently before the courts.

4.0 SPRFMO should to adopt a simple glossary of terms relevant to the management of bottom fishing impacts on VMEs

A VME glossary is necessary to avoid confusion, and to prevent the redefinition of terms in ways that may erode or change the meaning of previously adopted scientific advice or convention text. A good example is found in the terms "impact" and "effect". The two terms impact and effect do not mean the same thing; they have different scientific and technical meanings, and so it follows that they have different legal meanings. However, too often 'impacts' and 'effects' are misunderstood, or confused and as such are applied inconsistently or even mistakenly when meeting legal obligations.

We propose the following DRAFT list of terms, with definitions that are consistent with the way these terms have already been used in SPRFMO and/or in other regional organisations. We look forward to working with members inter-sessionally to progress this list; finalising and agreeing a VME glossary should be an item added to the agenda of SC 2023.

- **Effect:** Any measurable change in the state of marine taxa or habitats arising from interaction with fishing gear. Not all effects constitute impacts.

- **Footprint**: – The area of the seafloor within which fishing gear interacts with benthic organisms. Fishing footprint may be expressed per unit of fishing effort for a particular fishing method and gear type (e.g. for trawls, km^2 seabed contacted per km of trawl length), or as a cumulative footprint when calculated and summed for all fishing events in a defined period and area. Footprint is an aerial measure that does not incorporate the level of impact within the footprint (i.e. impact within the footprint may be less than 100%).

- **Impact**: Reduction in status of a particular taxon, habitat or other component of an ecosystem due to physical damage due to contact with bottom fishing gear, within a clearly defined spatial area and time. Impact can be expressed per fishing event (i.e. the proportion of a taxon damaged within the fishing footprint) or expressed cumulatively for all fishing events in a specified area and time. Impact varies 0 to 1.

- **Cumulative impact**: The net accumulated impact over time, including recovery. Cumulative impact varies 0 to 1.

- **Status:** The proportion of a particular taxon or habitat that remains intact and undamaged within a specified area and time. Mathematically, status varies 0 to 1, and is expressed as: (status) = 1 minus (cumulative impact).

- **Equilibrium status**: The status level at which cumulative impact will stabilise if fishing effort continues indefinitely at a defined level.

- **SAI threshold:** The status level (between 0 and 1) below which any additional impact is judged to constitute a 'significant adverse impact'.

Operationally, management measures are required to ensure that (SAI threshold) > status.

5.0 SPRFMO should progress a work plan to address the identified deficiencies and uncertainties in its bottom fisheries management framework, using available data and proven approaches

HSFG reiterates and calls attention to suggestions for a science workplan as referred in DW10-Obs1 and SC10-WP02. The analyses described are deliverable in the 1-2 year time frame, using available data, without the need for expensive research programs. The analyses we have identified are summarised as follows. A full rationale for each paper is summarised in SC10-Obs1 (pp 18-22)

5.1 Estimate the current intact status and equilibrium status of each VME taxon at the scale of each FMA and at the scale of the evaluated area, relative to the choice of SAI threshold

- This work is simply a straightforward update of the BFIA, incorporating recent operational decisions of the SC and Commission, reflecting changes to fishing effort, adding new taxa, and correcting identified weaknesses in the previous implementation

5.2 Test the ability of the taxon-specific habitat suitability index layers to predict VME bycatch

- This work is a straightforward corelation analysis to determine the spatial habitat models' ability to predict VME taxa abundance and catchability. Crucially, model validation has never been conducted at the spatial scale at which the models are intended to be actually used (i.e. at the FMA scale). The results of this work may demonstrate empirically which of the spatial model abundance scenarios are most accurate in different FMAs (i.e. which of horizontal bars we should be using to assess SAI in Figure 2).

5.3 *Using a simple simulation approach, test the performance of different move on rules to affect total impact on VME taxa, with reference to different scenarios of VME detectability and spatial patch configuration*

- This work is necessary to ensure that any move on rule is not having the perverse effect of increasing rather than decreasing the risk of SAI to VMEs

5.4 Estimate how many video-equipped trawls would need to be analysed in order to estimate the catchability of different VME taxa with statistical confidence, across a range of scenarios

- This work should be undertaken before SPRFMO commits to any new vessel-based research to examine VME spatial patterns and estimate catchability.

Conclusion

In conclusion, HSFG is here to help members, as we have offered and in fact delivered for more than a decade since the inception of SPRFMO and the interim measures. Our numerous papers have maintained a consistent theme, which is to allow for sustainable and responsible fishing in areas where fishing is allowed, while having as little impact as possible. In simple terms this is what the UNGA, the FAO, and the SPRFMO Convention all mandate. The fact that fishing effort has decreased substantially over the years must also be considered; given the scale of the SPRFMO area, 2 or 3 vessels going out for a few weeks per year into the very limited areas open to trawling cannot be considered high impact. We have at all times attempted to help members to understand what transpires 'at the coal face' of high seas fishing.

We ask that members please take the time to become familiar with the background and basis for our arguments here, even if their own industries have no direct link to bottom fishing in SPRFMO. We fear that while members were preoccupied with other matters, they have allowed vague arguments and shrill rhetoric, from those that would see bottom fishing banned, to undermine the very principles of sound science-based management and *truly* precautionary management that HSFG and the SPRFMO Convention have always been committed to. We have registered here our warning that if SPRFMO does not correct its course, we will, intentionally or inadvertently, set precedents in 2023 that undermine our collective commitment to transparent dialog, best available information, scientific integrity, and even legality under international law. We also warn that once established for bottom fisheries in SPRFMO, those dangerous precedents will have negative consequences also for other fishing methods, and in other jurisdictions.

The global bottom fishing industry is working hard and has been successful in minimising its effect on the environment, while providing economic benefits and a crucial source of protein for a growing world population. It is a demonstrable fact we are far better at feeding the world without heavy environmental impacts in the marine environment than in our terrestrial environment. We stand in opposition to those who would use vague or emotive arguments to undermine sustainable food production without reference to sound scientific and legal principles.

Sincerely yours,

Andy Smith

Chair HSG

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